



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,748	11/18/2003	Girish Chiruvolu	139145USNP	5517
24587	7590	08/01/2007		
ALCATEL LUCENT INTELLECTUAL PROPERTY & STANDARDS 3400 W. PLANO PARKWAY, MS LEGL2 PLANO, TX 75075			EXAMINER SEFCHECK, GREGORY B	
			ART UNIT	PAPER NUMBER
			2616	
			MAIL DATE	DELIVERY MODE
			08/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/715,748	Applicant(s) CHIRUVOLU ET AL.	
	Examiner Gregory B. Sefcheck	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 16-21, 23-25, 27 and 30-33 is/are rejected.
- 7) ☒ Claim(s) 7-15, 22, 26, 28, 29 and 34-36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Provisional application 60/450,486 filed 2/27/2003 is acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Averbuch et al. (US006192029B1), hereafter Averbuch.

- Regarding Claims 1, 5, 16, 17, 20,

Averbuch discloses a method for performing flow control in a wireless communication system (Title; meets claim 1 - network system; claim 20 – method).

Referring to Figs. 1 and 4, Averbuch discloses client routers 104 (downstream node) receive packets from the adjacent server router 102 (upstream node) and buffer the packets in queue 110 (Col. 3, lines 34-35; meets claim 1,17,20 - node comprising an input for receiving packets as downstream node from upstream node; claim 1,20 - buffer coupled to the input for storing received packets; claim 16 – upstream and downstream nodes are adjacent).

Averbuch discloses client routers initially receive packets forwarded from the upstream server router at a rate beyond the nominal rate during the START and

FILLING states. Averbuch further shows client routers send a DECREMENT message to the server router when it is detected that its queue depth exceeds a first upper limit, the message indicating to the server router to reduce the rate of transmission to the client router based upon the state of the server router when the message is received (Fig. 4, 5, 9; Col. 8, lines 5-8, 40-47; meets claim 1,20 - circuitry for detecting when a number of packets stored in the downstream buffer exceeds a buffer storage threshold; claim 1,20 – in response, issuing a message to the upstream node to selectively command the upstream node to reduce a rate of transmission of packets from the upstream node to the downstream node to a non-zero rate).

Averbuch shows that the DECREMENT message identifies the reduced transmission rate based upon the state of the server router at the time the message is received and the values of RATE and COUNT (Fig. 4, 5; meets claim 5 – message identifies the non-zero rate).

- Regarding Claims 2 and 21,

Averbuch discloses a method for performing flow control in a wireless communication system that meets all limitations of the parent claims.

Averbuch further discloses client routers send a STOP message to the server router when it is detected that its queue depth exceeds a second upper limit higher than the first limit, the STOP message indicating the server router to cease transmission to the client router based upon the state of the server router when the message is received (Figs. 5, 9; Col. 8, lines 50-54; meets claim 2,21 - buffer storage threshold comprises a

Art Unit: 2616

first threshold and second threshold larger than the first threshold; claim 2,21 - circuitry for detecting when a number of packets stored in the buffer exceeds a second buffer storage threshold; issuing a second message to the upstream node; claim 2,21 - second message commands the upstream node to cease transmission of packets from the upstream node to the downstream node).

- Regarding Claims 3 and 4,

Averbuch discloses a method for performing flow control in a wireless communication system that meets all limitations of the parent claims.

Averbuch discloses that the STOP message includes a STOP_COUNT that tells the server to reduce COUNT by a specified amount, equating to a period of time the server router must wait until transmission resumes (Col. 8, lines 56-64; meets claim 3 – second message identifies a period of time to cease transmission).

Averbuch discloses that the STOP_COUNT value is indicative of the amount of time the server router must wait until COUNT becomes positive, until the client router can reduce its outbound queue to a nominal level, before the stop value is satisfied (Col. 8, lines 60-67; meets claim 4 – circuitry for determining period of time in response to rate of transmission from the buffer and a measure of packet occupancy in the buffer).

- Regarding Claims 18 and 19,

Averbuch discloses a method for performing flow control in a wireless communication system that meets all limitations of the parent claims.

Averbuch shows that a DECREMENT message received by the server router reduces the rate of transmission to the client router for the next send interval (period of time) of the server router based upon the state of the server router when the message is received, the values of RATE and COUNT, and the outbound frame rate of the client router (Fig. 4, 5, 9; Col. 6-7, lines 43-50; Col. 8, lines 13-16; meets claim 18 – message to reduce rate to a non-zero rate for a period of time, circuitry for determining period of time).

When receiving the DECREMENT message at the server router during the START or FILLING states, it is inherent in Averbuch that the outbound frame rate (transmission rate from the buffer) of the client router be greater than the rate of receipt into the buffer, in order for the queue depth of the client router to normalize after exceeding the first upper limit (Col. 8, lines 40-47; meets claim 19 – circuitry determines period of time in response to transmission rate > receipt rate of packets from/to buffer).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 23-25, 27, and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch.

- Regarding Claims 23, 24, 30, 31,

Averbuch discloses a method for performing flow control in a wireless communication system (Title; meets claim 23 - network system; claim 30 – method).

Referring to Figs. 1 and 4, Averbuch shows server router 102 (upstream node) receives data from a data source to be transmitted on to client routers 104 (Col. 3, lines 20-34; meets claim 23,30 – node transmitting packets as an upstream node).

Averbuch discloses client routers 104 (downstream node) receive packets from the adjacent server router 102 and buffer the packets in queue 110. Averbuch discloses client routers initially receive packets forwarded from the upstream server router at a rate beyond the nominal rate during the START and FILLING states. Averbuch further shows client routers send a DECREMENT message to the server router when it is detected that its queue depth exceeds a first upper limit, the message indicating the server router to reduce the rate of transmission to the client router, based upon the state of the server router when the message is received (Fig. 5, 9; Col. 8, lines

Art Unit: 2616

5-8, 40-47; meets claim 23,30 – selectively reduce rate of transmission to a non-zero rate in response to receiving a message from downstream node; claim 24,31 – message issued in response to detecting packets stored in downstream buffer exceeds a threshold).

Averbuch does not explicitly disclose a buffer in the upstream node for storing the packets that are to be transmitted to the downstream node.

However, Averbuch discloses that the server router receives, from a data source, data to be subsequently delivered to the client routers at an appropriate time in asynchronous bursts (Col. 3, lines 29-34). Further, the flow control disclosed in Averbuch pertains to systems having timing differences between the send intervals of the server router and client routers, such that the server router cannot simply forward data to the client routers as it is received (Col. 3-4, lines 57-23). Therefore, the upstream node requires a way of storing data received from the data source before subsequent transmission to the client routers (meets claim 23,30 – buffer for storing packets in upstream node).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a buffer in the upstream node of Averbuch for storing packets to be transmitted to the downstream node, since data received from the data source cannot always be forwarded to the client routers as it is received at the server router.

Art Unit: 2616

- Regarding Claims 25, 27, 32, and 33,

Averbuch discloses a method for performing flow control in a wireless communication system that meets all limitations of the parent claims.

Averbuch further discloses client routers send a STOP message to the server router when it is detected that its queue depth exceeds a second upper limit higher than the first limit, the STOP message indicating the server router is to cease transmission to the client router based upon the state of the server router when the message is received (Fig. 5, 9; Col. 8, lines 50-54; meets claim 25,32 – selectively cease transmission of packets from the upstream node to the downstream node in response to receiving a second message; claim 27,33 - issuing second message by downstream node when a number of packets stored in the downstream buffer exceeds a second buffer storage threshold; claim 27,33 - second threshold larger than the first threshold).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Averbuch in view of Chiu et al. (US006526022B1), hereafter Chiu.

- Regarding Claim 6,

Averbuch discloses a method for performing flow control in a wireless communication system that meets all limitations of the parent claims.

Averbuch does not explicitly disclose determining the reduced non-zero rate by multiplying a rate that packets are output from the buffer by a constant that is less than one when detecting packets stored in the buffer exceeds the threshold.

Chiu discloses congestion prevention in a computer network (Abstract). Chiu discloses reducing the transmission rate of a transmission station (upstream node) by multiplying its current rate by a constant less than one upon receiving a message from a receiving station (downstream node) indicating lost packets (Col. 8, lines 45-60; meets claim 6 - determining the reduced non-zero rate by a rate that packets are output from the buffer by a constant < 1 when detecting packets stored in the buffer exceeds the threshold).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Averbuch by reducing the transmission rate by multiplying the current rate by a constant less than one, as shown by Chiu. This would enable the transmission rate to adjust itself to an optimum rate that utilizes the full bandwidth of the network without causing lost packets, such as when received packets overflow the buffer of a downstream buffer in Averbuch.

Allowable Subject Matter

6. Claims 7-15, 22, 26, 28, 29, and 34-36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- Regarding claim 7, 22, 26, 28, 34, and 35,

The prior art of record does not teach or fairly suggest the first and second messages selectively commanding the upstream node to either continue transmission to the downstream node at the current rate, reduce the rate or cease transmission entirely in response to a packet drop precedence in the buffer of the downstream node relative to a packet drop precedence in at least a portion of a buffer in the upstream node.

The cited prior art discloses first and second messages for selectively commanding the upstream node to either continue transmission to the downstream node at the current rate, reduce the rate or cease transmission entirely with consideration to multiple levels of drop precedence, but does not disclose relating the drop precedence in the buffer of the downstream node to the drop precedence in at least a portion of a buffer in the upstream node.

- Claims 8-15, 29, and 36 depend from claims 7, 28 and 35, respectively.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bishard (US 20030165148A1)
- Banerjee (US007190669B2)
- Bodin (US007139281B1)
- Jeffries (US006724776B1)
- Aweya et al. (US006690645B1)
- Kamiya (US006438138B1)
- Kilkki et al. (US006167030A)
- Kalkunte et al. (US006118761A)
- Smith et al. (US005784358A)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B. Sefcheck whose telephone number is 571-272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2616

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Gregory Sefcheck
Patent Examiner
7-27-2007